

*Amendments to the Specification*

[034] IAR/ACT pipe control portion 18 is connected to manifold 12 as shown in Figure 1a, and is primarily responsible for controlling pressures in the IAR pipe and the ACT pipe, primarily in response to movement of independent handle 34. When independent handle 34 is active, a movement of the independent handle 34 toward the FULL APPLICATION position 42, as shown in Figure 3b, will cause a rise in pressure in the IAR pipe. Brake cylinder pressure in the locomotives in the consist will increase proportionally to increases in pressure in the IAR pipe. A movement of independent handle 34 to the RELEASE position 40 will cause a venting of the IAR pipe and a release of the pressure in the locomotive brake cylinders due to the pressure in the IAR pipe. However, locomotive brake cylinder pressure due to decreases in pressure of the BP are not released from the locomotive brake cylinder. Pressure in the locomotive brake cylinder due to decreased pressure in the BP is released either by restoring pressure in the ~~BP~~ BP or by pressurizing the ACT pipe. This is accomplished by moving independent handle 34 to the BAIL-OFF position, shown as arrow 44 in Figure 3b.

[036] Brake cylinder control portion 14 responds to changes in pressure of the BP to provide automatic brake cylinder pressure, and to changes in the IAR pipe to provide independent brake cylinder pressure. A reduction of BP pressure or an increase in IAR pipe pressure will cause an increase in brake cylinder pressure.

[044] The portion microcontroller modules 60 can take input from several sources. Each microcontroller 60 can have pressure transducer inputs 66 which are used to sense pressures in various areas of the braking system, according to the function of the portion being controlled. Additionally, each portion microcontroller 60 can have bi-directional digital I/O ports ~~68~~ 65. Currently, the digital I/O ports are used for backup in the case where the supervisor computer on the locomotive fails, and are connected to various mechanical switches in the system that may indicate required actions. As an example, brake pipe control portion 14 has a digital I/O connected directly to automatic brake handle 32 to detect when this handle is moved to the EMERGENCY position. Not all digital I/Os need be used and some may be reserved for future expansion.